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RECENT EXPERIENCES IN THE TREATMENT OF FRACTURES BY SURGICAL METHODS

By

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COPENHAGEN

There was an impressive attendance at the Central Hall, Westminister, for the consideration of this paper (which was copiously illustrated with informative radiographic illustrations) at the morning session on Saturday, August 13th.

The chair was occupied by Professor WM. C. MITCHELL, of the Royal (Dick) Veterinary College, Edinburgh, who welcomed Dr. Moltzen Nielsen, introducing him as the well-known author of papers on the surgical treatment of fractures, among many other themes. Their essayist had studied surgical and X-ray technique at different European colleges and since 1934 had been the distinguished chief surgeon at the Animal Hospital and the Veterinary Clinic in Copenhagen, both founded by the Danish Association for the Prevention of Cruelty to Animals. Professor Mitchell then called upon their visitor to address Congress.

Dr. H. MOLTZEN NIELSEN: I am very honoured in having the opportunity to read this paper to you concerning problems which frequently can be difficult to solve. As the paper has been printed I shall confine myself to radiographic illustrations showing some of the most common and characteristic fractures and the different methods by which they have been treated.

[Dr. Moltzen Nielsen's sub-joined remarks should be read in relation to the paper, which follows them.

(1) In these very common antebrachial fractures reposition can be impossible even under anaesthesia because the medial fragment has penetrated the fascia and is fixed like a button in a buttonhole. Open reduction and a plaster cast bandage is the best way to secure satisfactory healing. Non-reduction is the cause of many deformed legs.

(2) The proximal fragment has penetrated the muscle. Open reduction has to be performed as early as possible and after eight to twelve days in an extension splint the stifle joint can be mobilised. Reduction at a later stage is nearly impossible and the joint will become ankylosed.

(3) Lateral angulation of the free part of the limb can be corrected by simple refracture in the first two or three weeks after injury. Later, an osteotomy is required. As shown in this picture, at first a V-shaped excision on the medial side was performed but as it was not sufficient to correct the position the ulna was chiselled from the outside.

(4) A single screw of stainless steel of the best quality can immobilise a fracture of flat bones, as shown here. This symphyseal mandibular fracture could not be immobilised by the common double wiring around the teeth.

(5) Two self-tapping screws are used to fix the small fragment to the main part of the ulna in a nine months old Belgian foal. Before and after operation and two months later are the stages illustrated. In these fractures surgical treatment is the only way to secure satisfactory healing but the screws have to be removed because they may cause persistent lameness. The operation is performed in the same way in the dog.

(6) Fractures of the neck of the femur may cause some trouble, partly because the correct insertion of the screw is exceedingly difficult on account of the orientation and partly because after the healing and removal of the screw, degeneration (necrosis) of the head may occur, presumably as a result of nutritional disturbances in the bone tissue.

(7) A rather frequent lesion is the characteristic fracture of the humeral lateral epicondyle with luxation of the medial epicondyles. Open reduction and fixation with a single transverse screw restores normal function to the joint, while a conservative treatment results in a totally deformed joint.

(8) In the same way surgical fixation may succeed on the lower part of the femur. This shows the condition before and after operation as well as after nine years normal function.

(9) Rupture of a ligament or tearing of a ligament at a point of attachment heal very badly. In such cases it is possible by the use of two screws and a wire to compensate for the functions of the ligament during healing (about six to eight weeks) and thus avoid lengthy and for the joint very often ruinous immobilisation. The ulna fracture in this connection is not important.

(10) In certain cases it may be necessary to combine screws with Lane's plate as it appears in this case of femoral fracture. There was an interposition of muscle in the fracture site and the operation was a very difficult one on account of the very small proximal fragment. Nowadays I think we would prefer, after the operation, to place the leg in a position of flexion instead of an extension splint.

(11) Here muscle traction after reduction of displacement was insufficient to maintain the fracture in good position. Alignment was maintained by a Lane's plate and three screws.

(12) A very severe fracture through the articular surface of the astragalus with total luxation of the middle joint. It was fixed by four screws and a Lane' plate with a satisfactory result. On account of the muscular traction it would hardly be possible to treat such a case satisfactorily without surgical intervention. In this case the healing was excellent, without any stiffening of the joint.

(13) Antebrachial fracture complicated by carpal luxation as a result of rupture of the medial ligament. When the fracture was reduced the joint luxated and *vice versa*. After fixation of the fracture (Lane's method) the joint could be fixed with a wire from the ligament distally to a screw in the radius. The leg was restored to full use in the course of eight weeks. The fracture may also be treated by the intramedullary pinning method.

(14) The Kirschner extension (skeletal traction) method with a thin stainless steel wire drilled through the distal fragment and tightened in a V-shaped cramp by a special form of extension splint may give good results in femoral and humeral fractures, but as the result of too many failures we have now abandoned this method and use the marrow-pinning indicated by Kuntscher.

(15) Femoral fracture before operation, after operation, and six weeks later and immediately after removal of the pin. In this a V-shaped stainless steel pin is introduced into the whole length of the marrow cavity, thus fixing the fracture in exact position so that in a few days the patient usually begins to take weight on the limb. It is a special method only applicable in diaphyseal fractures and requires no other support.

(16) In the majority of cases it has been necessary for me to reduce the fracture by open reduction, which, owing to present techniques, means only a minimal risk. At the same time open operation offers much more safety, as I have experienced with two cases of fracture of the humerus, for I was able to avoid injuries of the radial nerve which, had the closed method been employed, would undoubtedly have been jammed between fragments.

(17) A considerable advantage of this method is that complete firmness at the place of the fracture sets in, even if there happen to be several separated fragments, as long as each end of the bone is intact. In this case the pin was inserted from the distal end.

(18) This case of tibial fracture was seemingly well placed in an extension splint but would not heal ; after eight weeks there was a false joint. It was pinned with a cylindrical pin because a V-shaped pin of sufficiently small calibre was not obtainable. The pin was not removed but the healing and function was the best in my experience. Nine months later we did not observe any damage to the medullary cavity.

Concerning the results, you will observe they have improved during the years ; only seven out of 80 have not been cured and two of them are still alive with a shortened tail and leg. Presumably three of the rest might have been cured by use of the later improved techniques. Thus on the basis of present experiences it should only be a question of a minority of limb fractures in small animals that could not be cured. In the larger animals in certain cases there may be similar indications for surgical treatment. I wish, however, to state that surgical treatment should never be the standard treatment of fractures but a useful aid in cases which cannot be treated satisfactorily by conservative methods. It should be the duty of the practitioner to appreciate when the necessity for surgical interference arises and employ it as early as possible. In my hospital between 10 and 20 per cent. of all fractures have been surgically treated.

The paper was as follows :

Recent Experiences in the Treatment of Fractures by Surgical Methods *

During the last decade great advances have been made in conservative treatment as applied to bone fracture. Modern methods of anaesthesia have been a great help, for now we are better able to control pain, produce satisfactory relaxation and reposition is thereby facilitated. Better methods of immobilisation are at hand, such as the elastic bandage and new plaster techniques, and healing is enhanced. We know that diet plays a part in good recovery and the value of protein and vitamin and mineral adjuncts is recognised.

In spite of these welcome aids to restoration there are still those cases which call for precise operative interference. This statement applies particularly to small-animal work but no doubt there are occasions on which the methods and techniques may be applied with advantage to the horse and the animals of the farm.

Svend Larsen, in 1910, was the first veterinarian in Denmark to perform osteosynthesis according to Lane's technique. The fracture was of the humerus of a dog and he reported complete resolution. In 1927 he recorded another 23 cases, in some of which he used Lane's plates and screws ; in others his method was that of Parham. Of these 23 cases 16 were resolved.[1]

During the period 1928–39, there were 48 cases at " Dyrehospitalet " (47 dogs, one cat). In 30 cases Lane's plates and screws were used, in six cases Parham's band, in one metal sutures, and in seven cases various combinations of the above methods were employed. Of the 48 cases, 39 were satisfactorily resolved. The somewhat improved results are probably attributable to increased experience in regard to diagnosis as well as to improved technique. Now only stainless screws, plates and wire are used. Such metal does not irritate the tissues and the screws do not loosen so easily.

We preferred to perform our operations about the sixth day after the accident, for by that time the body and the tissues had recovered somewhat from the effects of traumatic shock.

In this series there were nine unsatisfactory results for the following reasons :—

Primary infection, one.
Paraplegia, one.
Secondary fracture proximal fragment, one.
Ankylosis of stifle joint, three.
Non union, two (in spite of extensive excision and satisfactory fixation).
Post operative sepsis and death, one (self mutilation[2]).

During the period 1939–48 operative fracture treatment was performed in 80 instances (79 dogs, one horse). The majority of the methods previously mentioned proved satisfactory. In some cases certain modifications improved results. Some techniques were abandoned, *e.g.*, cerclage (after Parham). In diaphyseal fracture of long bones results improved following the introduction of intra-medullary pegging. Penicillin-sulpha medication widened the scope of the work by ensuring greater protection against infection.

The site of fracture and methods employed are depicted on the chart. (*See foot of page* 793).

Indications for operative treatment are as follow :—

(1) Fascia and muscle intervention.
(2) Fractures near or involving joints and adjacent structures.
(3) Unsatisfactory immobilisation.
(4) Delayed healing (pseudarthrosis).
(5) Malposition.
(6) Open fractures.

The most simple operative fracture treatment—open reduction—is most commonly performed on the antebrachium (Fig. 1*), but it may also be indicated on the crus, in cases where the medial fragment perforates the powerful fascia—

* Presented to the Sixty-seventh Annual General Meeting and Congress of the National Veterinary Medical Association, in London, August 13th, 1949.

* Figures were shown at the meeting.

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FIG. 3.—(*a*). Fracture lower end of radius : healing with angulation.

(*b*). Demonstrates straightening of the angulation following osteotomy.

FIG. 7.—Fracture condyle of humerus, with luxation, treated by placing screw across and through both condyles.

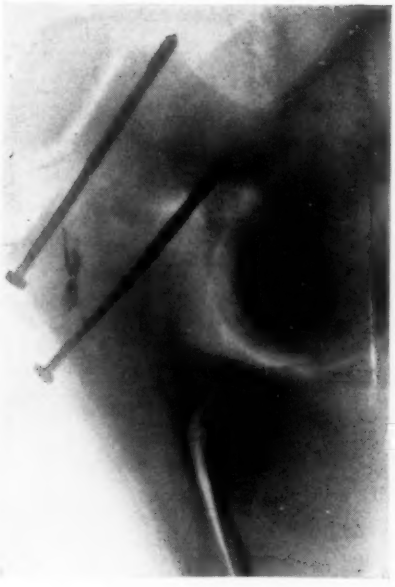


FIG. 5.—Fracture of olecranon (horse) : immobilisation by insertion of two screws.

FIG. 6.—Degeneration of head of femur.

FIG. 9.—Rupture of lateral ligaments of the elbow joint : fixation with two screws and a wire.

FIG. 8.—(*a*). Fracture lower end of femur.

(*b*). Fixation of fracture with screw (still in position nine years post-op.).

FIG 11.—Fracture lower end of femur : fixation with Lane's plates.

FIG. 12.—Fractured hock : fixation with Lane's plates.

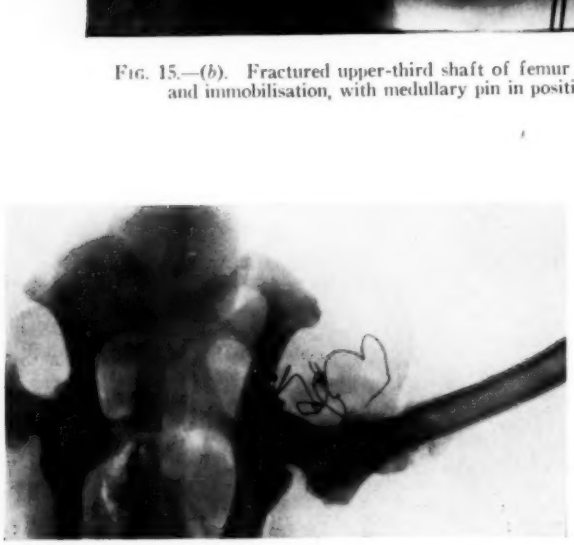
* A selection from the radiographs projected at the meeting, numbered to correspond with Figure references in text.

FIG. 14—Fractured shaft of femur (lower third): reduction and fixation with Kirschner wire and clamp.

FIG. 17.—Fracture of radius and ulna: medullary pin in position, introduced from the distal end.

FIG. 15.—(*b*). Fractured upper-third shaft of femur: reduction and immobilisation, with medullary pin in position.

FIG. 16.—Reduction of fracture of mid-shaft, humerus, with medullary pin in position.



(*c*). Healed fracture: pin removed.

which in this situation is connected with the periosteum—and is caught like a button in a buttonhole. Often the opening of the fascia will have to be dilated before one can get a pair of forceps around each fragment in an angular position and bring them into their right place again. Where the medial fragment has perforated the skin, which frequently occurs, a total excision of the accidental wound is performed. After suture it is sufficient in the case of transverse fractures to place the limb in plain plaster bandage. Generally primary healing will take place and good function be restored in the course of three to four weeks. Only in one case, and in spite of prolonged treatment, did healing fail to take place. In femoral fractures open reduction has been indicated three times as a result of one of the fragments having penetrated the surrounding muscles (Fig. 2). Where internal fixation has not been required, healing has been obtained by placing the limb in extension splint after suture of muscles and skin.

These open reductions have been performed on account of our previous experience that callus formation through muscle and particularly fascial interposition takes place so slowly and uncertainly, that when repair is complete the bone frequently is deformed and often repair is not complete and a false joint is formed. In the forearm and thigh the final result of such union may so compromise function that the animal is a cripple and surgical correction is necessary. In case of crooked union it is relatively easy in the first few weeks to break down such a union and to correct alignment and reset in a more correct position. When such procedure is necessary it more than doubles the period of recovery and is a greater inconvenience to the animal than if one had adopted open surgery in the first instance. Where the callus is too consolidated, in the wrong position or a false joint is formed, it may be necessary to perform osteotomy (Fig. 3) and use some form of internal splinting. Good results may be obtained, but in one case, after cross-sectioning a vertebra on account of angulation, gangrene set in a few centimetres from the tip of the tail. Previously it was sometimes difficult to obtain sufficient firmness after excision of pseudarthroses, inasmuch as it did not seem possible to arouse the healing tendency of the bone in the same way as after a normal fracture. This difficulty now seems to be overcome by the use of the intramedullary pins.

Screws afford very good fixation, and we therefore prefer them to nails or tacks, because often two tacks inserted in opposite directions are required to obtain the same rigidity which may be obtained by the use of only one screw. Furthermore, it is often easier if one uses screws to draw the fragments closer together. Only screws of stainless steel and of the best quality should be used. Generally the screws are inserted in previously drilled channels, but sometimes it may be advantageous or necessary to use screws of the LAMBOTTE or JOHANSSON model, as these may be inserted without previous drilling. Screws are being useful in fractures of flat bones, *e.g.*, maxillae and mandibles, in cases where a common thread ligature around the teeth does not give sufficient firmness (Fig. 4); also when it is necessary to join a separated portion of bone to the main part of the bone. This happens in the case of fractures of the two-armed levers: olecranon, calcaneus and the neck of the femur, where on account of muscle action it is almost a necessity to perform osteosynthesis in order to obtain favourable results (Fig. 5, horse).

As a rule this rarely fails, as will be noted in the chart. Fractures of the neck of the femur may cause some trouble, partly because the correct insertion of the screws is exceedingly difficult on account of the orientation and partly because after the healing and removal of the screw degeneration (necrosis) of the head may occur, presumably as a result of nutritional disturbances in the bone tissue (Fig. 6). FRITZ NILSSON[3], who was the first to describe the method, has made the same observation.

If osteosynthesis is necessary in near-joint fractures screws are preferred inasmuch as the smaller fragment has to be attached to the rest of the bone with precision. In the case of diaphyseal fractures one may often obtain good function in spite of a moderate displacement. On the other hand, a slight shifting near a joint or in the joint surface itself may have a disastrous effect. In addition to this, the fixation must be of such a character that one is able to permit the patient to perform movements of the joint as early as possible in order to avoid anchylosis. A rather frequent lesion is the characteristic fract. epicondyli humeri lateralis with luxation of the medial epicondylus (Fig. 7). Open reduction and fixation with a single transverse screw restores normal function to the joint, while a conservative treatment results in a totally deformed joint. In the same way surgical fixation may succeed on the lower part of femur. Fig. 8 shows status before and after operation, as well as after nine years' normal function.

Injuries such as tearing of a ligament at a point of attachment, or rupture of a ligament, heal very badly. In such cases it is possible by the use of two screws and a wire to compensate for the functions of the ligament during healing

No.	Fracture	Open Reduction	Re-fracture and Osteotomy	Osteosynthesis					Total
				By Screws	By Screws and Wiring	Using Lane's Plates	Kuntscher Pin Method	Kirschner Splint Method	
1	Maxilla	—	—	—	—	—	—	—	4
	Mandible	—	—	1	2	1	—	—	
2	Vertebrae	—	1 (I)	—	—	2 (I)	—	—	1 (I)
3	Humerus	—	—	1	2	1	6	3	14 (I)
4	Ulna	—	1	3*	—	2	—	—	5
5	Radius	13 (I)	3	—	1	7 (II)	1	—	20 (I)
6	Femur	3	—	3 (I)	—	1 (I)	8	6	27 (III)
7	Tibia	—	1	3	—	1 (I)	4	—	9 (I)
	Total	16 (I)	6 (I)	11 (I)	5	14 (IV)	19	9	80 (VII)

( ) = Not cured. * One Horse.

(about six to eight weeks) and thus avoid a lengthy and for the joint very often ruinous immobilisation (Fig. 9).

In certain cases it may be necessary to combine screws with Lane's plate, as shown in Figs. 10, 11 and 12; all are cases which otherwise it scarcely would have been possible to cure.

Lane's method, whereby the fracture is fixed with the help of a narrow perforated plate of stainless steel by the assistance of a screw—but preferably two screws—in each fragment, was used extensively even in the first year of this period, also in the case of diaphyseal fractures. It still has its indications in certain special cases as shown in Fig. 13: fract. antebrachii complicated by luxatio carpi as a result of rupture of the medial ligament. When the fracture was reduced the joint luxated and *vice versa*. After fixation of the fracture (Lane's method) the joint could be fixed with a wire from the ligament distally to a screw in the radius. The leg was restored to full use in the course of eight weeks.

It appears from the chart that four of the remaining cases were not cured. In one (femur), however, death was due to intercurrent causes three weeks after operation; in two cases failure of healing must be attributed to technical errors; in one of them (humerus) the Lane's plate broke, in the second (femur) two of the screws came loose. In the fourth case treatment progressed according to plan, but operation was first performed three and a half weeks after the femoral fracture was sustained, at a time when a pseudarthrosis already was developing, and the dog had to be put to death after a period of 16 weeks as firmness had not been obtained.

On account of these—although not very numerous—unsatisfactory results we experimented for some years with os extensio a.m. KIRSCHNER, as indicated by E. F. SCHROEDER[4], on diaphyseal fractures of the humerus and femur. A thin stainless wire is drilled through the distal fragment. With the assistance of a u-formed cramp it is tightened, so that it does not cut, and through the fixation of the cramp to an extension splint, specially formed in each case, a suitable pull is exercised on the distal fragment, in such a way that the fracture is reopened and reset. The method seems very attractive in that traction is limited to the fractured bone, and it may produce excellent results, as appears from Fig. 14 and the chart. On the latter, however, only the cured cases are listed; there was an equal number of cases on which the same treatment was tried with negative results and other surgical treatment or bandaging with simple extension splints was substituted.

The method has not been used by us since the introduction of the marrow-pinning method, which was indicated by the German surgeon KÜNTSCHER in 1940[5], after having been tested upon dogs with experimental diaphyseal fractures. It differs from the older method in which short ivory tacks were inserted through the place of fracture and which never became popular. The nail is inserted for almost the whole length of the bone. It is finely polished and made of stainless steel; it will not corrode or apparently do any damage to the marrow. The nail is grooved (v-formed transversally) and is of a calibre that fills up the marrow cavity completely. Eventually more nails can be driven in in such a way that one nail rests inside the other and thereby increases the strength. Opposite the pointed end the nail is provided with a fenestra, in which a small hook may be placed, thus making it easy to remove the nail by the help of a special extraction apparatus.

It might be reasonable to fear lasting damage of the marrow owing to the violent trauma occasioned by the introduction of the nails and their presence for several weeks. According to Küntscher's researches and our own experiences, however, this does not seem to occur. The grooved form of the nail should counteract a rotation of fragments around the axis of the bone. Reports have been made later regarding marrow-pinning with cylindrical tacks. These, however, according to our experience, do involve a risk in the aforementioned respect, and we have made use of one of these in only one case, when one of the previously mentioned nails of sufficiently small calibre was not obtainable. The nails most commonly used with dogs have measured 12 to 20 cm. in length and 0·25 to 0·6 cm. in diameter. Calibre and length are decided on the basis of X-ray photographs before operation.

The introduction itself into the humerus, femur and tibia takes place as a rule from the proximal end by drilling a hole only a little larger than the calibre of the nail. In the radius one drills or chisels a somewhat larger window into the marrow cavity, either proximally or distally to the fracture, according to circumstances. The nail is inserted and driven in with a hammer until the point has reached the place of fracture; this is reduced and the nail driven farther into the marrow cavity of the second fragment until it is secured firmly. The bone has then regained its normal length and form, and the nail is driven in so that only the extraction fenestra remains outside the bone. Küntscher states that introduction always can take place without opening at the site of fracture. In this connection it is worth mentioning that his material embraces experimental fractures, which presumably have been operated upon immediately after the formation of the fracture. I have made use of this method myself with success in a couple of cases (tibia), but when, as often happens, it is a case complicated by considerable fracture-haematoma it is both too slow and uncertain, even by X-ray illumination, to introduce the nail into the second fragment (Fig. 15).

Therefore, in case of such fractures, I prefer open reduction, which, owing to present techniques, means only a minimal risk. At the same time open operation offers much more safety, as I have experienced with a couple of cases of fracture of the humerus, for I was able to avoid injuries of the N. radialis, which, had the closed method been employed, would undoubtedly have been jammed between fragments (Fig. 16).

A considerable advantage of this method is that complete firmness at the place of fracture immediately sets in, even if there happen to be several separated fragments, as long as each end of the bone is intact (Fig. 17). No bandaging is thus necessary beyond the minor bandage which must cover the wound until the sutures are removed. We often make use of a technique indicated by H. F. WIRSTAD[6] using the free ends of the skin sutures to fix a gauze-tampon in position. The firmness at the place of fracture causes the pain to cease very quickly, so that very often in the course of only a few days the patients begin to support themselves on the wounded limb, and as there is a completely free mobility in all joints of the limb, normal function is rapidly obtained, which in accordance with modern views in regard to fracture treatment encourages and quickens the healing process. This circumstance was of special consequence in a case with fracture of both femurs. Intra-medullary pins were inserted in the course of one session. The dog was able to support itself on both hind legs a few days later. Often the patient is discharged from the hospital after ten days, when the sutures have been removed, returning three to six weeks later to have the nail or pin extracted. This we have so far done in all cases with the exception of one (pseudarthrosis-tibialis), where by way of experiment the nail was allowed to remain under constant X-ray control, and in which, nine months after operation, normal function still obtains and the X-ray photographs show nothing disturbing (Fig. 18). Each and all of the 19 cases treated in this way have been cured completely. Yet in one case of femoral fracture sudden violent lameness recurred three weeks after operation. An X-ray showed secondary fracture of the neck of the bone. The nail was

extracted—the original fracture had healed—and in consideration of the osteoporosis in the neck, which possibly was caused by the nail having been inserted a little too far medially, conservative treatment was adopted. The fracture of the neck healed without any shortening worth mentioning, and in the course of a couple of weeks the dog was relieved of lameness and could be used for hunting. The limitation of the method is, that it is applicable only to diaphyseal fractures of long bones, and therefore cannot replace the previously mentioned special methods.

The fact that treatment with Stader apparatus is not mentioned here is due to lack of personal experience with this method. I did not succeed in getting the appliance to Denmark before the war, and since 1945 we have introduced the marrow-pinning method, which covers the same indications and in our opinion has considerable advantages for veterinary use.

With regard to osteosynthesis operations, it may be said, generally speaking, that they demand a deep anaesthesia—nembutal or, as far as the hind legs are concerned, morphine-scopolamin in connection with epidural anaesthesia, together with a strictly enforced aseptic technique. Introduction of local penicillin-sulpha powdering of the operative wound seems to prevent the few post-operative suppurations previously experienced—which, however, rarely influenced the good results. Post-operative penicillin-sulpha treatment enables one to obtain primary uncomplicated healing even in the case of open fractures. The penicillin-sulpha powder also seems to have a restraining effect on the not inconsiderable serous exudation, which appears in response to the cutting of larger muscle masses (humeral and femoral regions) and which previously necessitated the insertion of drainage tubes for the first couple of days. The fixation metal may very well heal in, but generally I prefer to remove it after healing of the fracture.

Osteosynthesis demands considerable skill and experience on the part of the surgeon. It will hardly become the daily task of the general veterinary practitioner, but be reserved for those specially interested and experienced. This method of operative treatment of fracture should not be made a standard treatment for all cases. It should be performed only in those cases which experience proves will not repair satisfactorily and give a good functional result: in my hospital between 10 and 20 per cent. of all cases of fracture. If these operative measures are necessary a decision should be made as early as possible in order to obtain the best results.

If we look at the collective result, it is shown that out of 80 cases operated upon, 73 were cured with a satisfactory functional outcome. Out of the seven not cured one died of intercurrent disease, one continued to live with a slightly shortened tail as a result of gangrene in the tip of the tail, and another was left with a shortened and atrophic hind leg. Four were put to death on account of unsatisfactory healing and function. Of these four, which are to be found in the first year of the period, presumably three might have been cured by use of the later improved techniques. Thus, on the basis of present experiences, it should only be a minority of the limb fractures of smaller animals that could not be cured. With regard to the larger animals, there are indications for operative fracture treatment in certain cases.

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[4] Schroeder, E. F. (1939.) *Canine Surgery*, page 90.
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Discussion

Mr. Gordon C. Knight, M.R.C.V.S. (Royal Veterinary College), who was the first opener of the discussion, said: I have the honour and privilege to act as one of the openers of Dr. Moltzen Nielsen's most interesting paper and offer my sincere congratulations to the author, not only on his paper, but on the wide scope of the fracture treatments he has carried out. Dr. Nielsen's contribution to the subject is very comprehensive and those of us who are in any way concerned with small-animal surgery must have been enlightened from the insight which has been given into this particularly interesting field. As the result of the work done by Dr. Nielsen and others it is my view that internal fixation of fractures in small animals by open reduction and intramedullary pinning or plating with inert metals is now clinically established. In the majority of cases results are incomparably better than any which could be reasonably hoped for from closed reduction and external fixation. These statements you may consider go beyond the modest summing up which Dr. Nielsen has made of his work but, if this is the case, perhaps they will be excused on the grounds of my enthusiasm. My experiences with some methods of osteosynthesis, notably plates and screws, have been fewer than Dr. Nielsen's; thus it is encouraging to me to discover his views in general agree with my own.

As far as intramedullary pinning is concerned, Dr. Nielsen's main conclusions again coincide with mine. I have in mind particularly that:—

(*a*) certain diaphyseal fractures are probably best treated by open reduction and intramedullary fixation with a stainless steel pin,

(*b*) such pins are inert in the living tissues and appear to be well tolerated for periods far in excess of those necessary to allow adequate bone union,

(*c*) small-animal fractures treated by this means frequently require no external means of support, and

(*d*) the limb often regains some useful function within a matter of days.

This I think is the agreed case in favour of intramedullary pinning, but with due regard to the very important if not indispensable part played by penicillin and the sulpha compounds in protection against infection which almost eliminates the risk of post-operative sepsis.

At the Royal Veterinary College, London, during the past ten years we have tried various methods of internal fracture fixation. These have included the use of silver and stainless steel wire, plastics and absorbable protein preparations (used with the co-operation and guidance of Dr. George Blain) and occasionally bone autotransplants. More recently, by the kindness of Mrs. Helen Robertson, M.R.C.V.S., we were able to use the Kirschner-Ehmer splint and, although I am sure we have not fully explored its possibilities and perhaps in my hands the splint was not used to best advantage, the tissue toleration of stainless steel pins in clinical surgery became very evident to us.

We then turned to intramedullary pinning and in the past 18 months have carried out about 45 open reduction operations using 18/8 stainless steel cylindrical rod of various diameters. The main aims have been to provide maximum support by using as long a pin as possible and to allow no protrusion of the pin through the skin but sufficient protrusion through the bone proximally to facilitate withdrawal when necessary. The method employed has been to predetermine the length of support required from a radiograph and, after open reduction of the fracture, bore the suitably held sharpened pin into position by rotation without preparatory drilling. When the pin has been inserted to the required distance it is broken at a prepared point to leave a convenient length outside the bone. In these circumstances cylindrical 18/8 stainless steel pin has proved very largely satisfactory and so far there has been insufficient evidence of rotation of the distal fragment to suggest that the use of the Kuntscher type V section pin would prove a material advantage. The long bones which have proved suitable for pinning by this means are the femur, tibia and humerus, but unfortunately experience with the last has been very restricted by comparison with the others. The radius in our experience cannot conveniently be pinned and it seems that in certain cases the Lane type plate is likely to prove satisfactory.

The Sherman vitallium plates and screws and, in fact, all vitallium surgical appliances used by us so far, have proved most successful in the cases in which it has been possible to employ them. In order not to take up too much time I have omitted to take into consideration epiphyseal separation and supracondylar fractures but certainly agree with Dr. Nielsen's views.

It has been my intention in this opening to convey my great appreciation of Dr. Nielsen's work and in this above all I hope I have succeeded.

Lieut.-Colonel JOHN HICKMAN, M.R.C.V.S., (Newmarket), who followed Mr. Knight in opening the discussion, said: Firstly, I should like to thank you for inviting me to be one of the openers of this discussion and secondly, I desire to congratulate Dr. Moltzen Nielsen on the able manner in which he has discussed and compared the advantages and disadvantages of treating fractures by the various methods which have been in vogue or become popular during recent years.

Our immediate aim in the treatment of fractures should be to reduce, align and immobilise and at the same time permit maximum use of the limb to assist healing and prevent muscle atrophy. Naturally these aims may be most satisfactorily carried out, to a nicety, by practising internal fixation.

However, generally speaking, I do not consider that there is any one method of treating fractures which is superior to any other. The simplest methods are often the best. We must rather consider what methods are available and apply that method which will prove most suitable to the particular case in question.

In this respect I think Dr. Nielsen's paper is especially commendable as he has given us his experience of treating a large variety of fracture cases by the various techniques of internal fixation.

Mr. Knight has most ably discussed Dr. Nielsen's paper and therefore my remarks will be of a general nature as I feel that very little further comment is necessary. However, there is one point which has only been mentioned in passing which I think is worthy of further mention: the type of materials to be used for internal fixation.

It may be said that the practice of internal fixation dates from the antiseptic era of Lister and that enthusiasm for its use was stimulated by the introduction of X-rays which showed the high percentage of unsatisfactory reductions being obtained by the then accepted methods.

For many years in spite of a real appreciation of the dangers of bacterial infection, the use of antiseptics and the practice of most rigid aseptic technique the results obtained were disappointing.

In many cases screws became loose due to a rarefying ostitis, the plates became corroded and caused an erosion of the bone, there was discoloration and excessive reaction in the surrounding tissues.

The history of the materials used and the gradual evolution of the metals as employed to-day is a most interesting study. In the first instance research was directed towards infection and the foreign body reaction of the materials and special attention was paid to the pathological changes in the bone and surrounding tissues. Little definite progress was made in this direction and it was not until the chemical and electrolytic phenomena, which take place around metals in the body, was recognised that many of the sequelae following internal fixation were overcome. It is now generally accepted that this electrolytic action is mainly responsible for the erosion of the bone and the excessive formation of scar tissue.

This point having been recognised, the next step was to find a suitable metal inert in the body tissues. Investigations into the various types of stainless steel led to the discovery that a stainless steel containing 18 per cent. chromium and 8 per cent. nickel was the most satisfactory, being the most resistant to electrolytic action. Further researches showed that if 4 per cent. molybdenum was added to this steel its usefulness for orthopaedic purposes was further enhanced, having a greater resistance to corrosion in the body fluids, and more resistance to—although not entirely free from—electrolytic action. This stainless steel is referred to as 18-8 SMo.

Finally it was discovered that the alloy vitallium (cobalt 65 per cent., chromium 30 per cent., molybdenum 5 per cent) is entirely free from electrolytic reaction, and is inert in body tissues and fluids. Of recent years 18-8 SMo stainless steel has to a great extent been replaced by vitallium, which alloy has the advantage of being inert in body tissues and more malleable than stainless steel whilst retaining great tensile strength, but its high cost is a disadvantage to the veterinarian.

Research to obtain even more suitable materials for internal fixation still continues. An ideal material must be light, strong enough to withstand the strains and stresses imposed upon it during the process of healing, non-irritating to the tissues and have no electrolytic action. The use of metals frequently necessitates a second operation for their removal and in consequence the use of absorbable materials has been investigated. Although such a material would appear to be ideal, one must appreciate that the inflammatory processes necessary to bring about absorption may cause irritation to the bone and surrounding soft tissues with subsequent scarring and delay in healing.

The purpose of these brief remarks concerning metals is to show that just any metal is not suitable for internal fixation and it is worthy of note that plates and screws must be of the same metal; this is especially applicable to stainless steel because unless screws and plates are of exactly the same formula the electrolytic action will be enhanced and local destruction of bone will result. Unless special attention is paid to the materials used, failures will occur and the methods of internal fixation will fall into discredit.

Dr. Nielsen very rightly has pointed out that open reduction and internal fixation of fractures, by whatever method employed, cannot be undertaken lightly. The advent of the sulpha drugs and the antibiotics has been a great adjunct to the success of much orthopaedic surgery. But the use of these drugs whilst making many operations now possible and more safe, does not preclude the practice of sound surgical technique and is no excuse for a lapse in its practice. I think it is safe to say that, even with the assistance of the sulpha drugs and the antibiotics, operations upon fractures require a more precise aseptic technique than similar operations upon the soft tissues. Personally I look upon these agents as a means of supplementing the natural resistance of the patient, and therefore any other measures which will assist in increasing the patient's immunity should be carried out. The most important of these is a good aseptic surgical technique, thereby reducing trauma and infection.

Finally, I should like to endorse what was described by Mr. Knight as Dr. Nielsen's modest summing up. Whilst appreciating the very important part that internal fixation has to play in veterinary orthopaedics and not minimising its usefulness for carefully selected and specific cases, I do not consider it proper to practice open reduction and internal fixation on those cases in which the desired result may be obtained by more conservative methods.

General Discussion

Mr. F. C. GILLARD (Folkestone) said that it had taken a good deal of urging to prompt him to speak because he could not enlighten the meeting on the more modern methods of fracture treatment. He wished, however, to pay tribute to a great worker on this subject, the late Mr. Hey Groves, whose name had not so far been mentioned.

Prior to the 1914-18 war, he had had the privilege of working with Mr. Hey Groves at University College Medical School, where he was carrying out research work on fracture treatment, bone grafting, etc. As they all knew, Sir Arbuthnot Lane was the pioneer in this work although he had not concerned himself a great deal with the small animal. Hey Groves, who afterwards became world famous in orthopaedic work, had carried out research in an endeavour to improve upon the materials rather than upon the technique of Lane, and those who had read his book would be familiar with his deductions.

Lane had used small plates and screws and had been most successful himself, but those who attempted to copy him found that where he had succeeded, they failed. The short screws were faulty in as much as the thread was not carried in to the head of the screw or into the plate and, furthermore, the screw was the ordinary joiner screw. Hey Groves had proved beyond all doubt that the cause of the small plate becoming loose in so many cases was due to that fault and further went on to say that the cases of suppuration which often occurred were due to the movement on the part of the plate or screw, or both, on the bone, and the X-ray

work illustrated in his book clearly established this fact: the screw did not bite into the bone. He had been very keen to carry out his technique on large animals but unfortunately the war had precluded such work.

They had, however, carried out an operation upon a horse on the day of mobilisation in 1914, and at this time the method was not to use short plates and screws but long plates and bolts which went right through the bone, fixed by washers and bolts. (This was the technique suggested for fracture of a long bone in the horse.) A success had not been expected in this case because the animal had been turned out into a field and flies had got into the wound which was very septic, and there was an oblique fracture of the metatarsal bone as well as a star fracture, but it was an opportunity to carry out the technique.

The animal was lowered in slings and put under chloroform. The technique of drilling holes through the metatarsus was then carried out, plates being fixed on each side of the bone and the fracture was completely fixed. But, unfortunately, the anaesthetist had allowed the horse to regain consciousness just as the suturing of the skin was nearly finished and in struggling for the heel of the injured leg in front of a rope suspended from a beam it finally split the metatarsal nearly the whole length just behind the edge of the plate. This would probably not have happened if there had not been a sub-periosteal fracture as well as the complete oblique one.

This particular operation was mentioned because it was hoped that veterinary surgeons would persevere on these or similar lines as well if they decided to carry out the method of *direct* fixation as against the later method of Hey Groves, which was transfixion by pinning, with adjustable side bars for correcting over-lapping. Hey Groves had done much valuable veterinary work, but unfortunately for them he had become too occupied with human surgical work after the war to help them further, which he was most anxious to do.

Mr. Gillard concluded by saying how much he had enjoyed Dr. Nielsen's address and outstanding surgical contribution.

Dr. J. C. Peters (Rotterdam) had thought before the last war that the treatment of fractures in small animals was very easy but since that time he had met with difficulties of bad callus. He had used the Stader splint from America and had many times got good results, but its use was rather difficult and required great experience.

In one case he had encountered of a fracture of the femur, after a period of five weeks the splint was removed and the bone could not be bent, but two days later the bone had bent very considerably. He wished to ask Dr. Nielsen if he could offer a remedy for this problem. He had tried using very large doses of vitamin D and calcium but the resultant effect had not been particularly satisfactory. The problem was perhaps due to the condition of food and the lack of meat but it presented great difficulty in the treatment of fractures, with dogs especially.

Mr. Turnbull (Basingstoke) wished to put forward the point of view of the general practitioner. Although his own work on this subject had been on a relatively small scale he wished to give his confirmation to what had been said by Dr. Nielsen, Mr. Knight and Col. Hickman.

He urged that the technique of open reduction should be reduced to as simple a proportion as possible, particularly in connection with the G.P. who was somewhat limited by the absence of very fine hospital equipment. Adequate exposure of the fracture site was important because it reduced the amount of trauma of the tissues, but of course it required considerable suturing which had to be carried out very carefully. His experience had taught him that it took nearly twice as long to suture the incision as to do the pinning.

He wished, finally, to pay tribute to the work of two American orthopaedic surgeons, Venable and Stuck, for their valuable research work into the history of open reduction and experiments in the electrolytic effects of metal in bone.

Professor Wirstad (Norway) advised the use of two stainless steel splints, of the type which did not have electrolytic reactions, introduced right through the bone fragments (transfixation). He had been using these for a couple of months with more advantageous results.

Osteosynthesis as applied in the case of dogs could be used for larger animals. With horses one could also put the splint on with a cast of plaster of paris, which provided a better method than the use of plaster of paris alone.

Major Hamilton Kirk (London): He wished heartily to congratulate Dr. Nielsen for his excellent paper and the openers of that instructive discussion, in which he had been extraordinarily interested as it seemed to open up to general practitioners a far better means of saving many of their patients than they had enjoyed hitherto.

In these days they had great numbers of very valuable greyhounds engaged in racing, many of them worth up to £2,000 or £3,000. Fractures were very common indeed and unless perfect unity was accomplished they became useless and a total loss. Again, it was lamentable to have to destroy good bloodstock because of fracture and he would await with great interest and expectation the work of pioneers in this method of treating and saving valuable racehorses, hunters and other animals of sentimental value. He had wondered, however, what the chances were of osteomyelitis, or gangrene, setting in after open reduction and, in order to avoid loosening of screws or plates, would it ever be advisable to apply an external splint to reinforce the internal ones ?

He had seen some excellent work on the part of Mr. Knight at the Royal Veterinary College, and he hoped very soon he was going to perform for him what he would describe as a miracle if he succeeded. Possibly they would see this case record in the veterinary press in the not distant future.

Mr. J. W. Heney (Dublin) was concerned with the length of the screws in relation to the thickness of the bones when applying Lane's Plates to fractured members. He asked Dr. Nielsen if he advocated the embedding of the tip of the screw in the opposing compact tissue, in order to avoid the loosening which was experienced in some cases. "Pinning" of fractures appealed to him and he intended to employ this treatment when a suitable case presented, now that he had learnt how to proceed with this treatment. X-ray diagnosis was essential for orthopaedic bone treatment, as it was also advisable for cases of ordinary treatment.

The Reply

Dr. Nielsen, in a short reply, offered his best thanks to those who had contributed to the discussion for the kind way in which they had received his paper. It had been a great pleasure for him to come over and, by the kindness of Mr. Knight, to see the excellent results obtained here by the methods described.

There was a small disagreement about the shape of the pins. He had seen rotation after the insertion of the cylindrical pin and had had to replace it by the insertion of a V-shaped pin. Thanks were due to Colonel Hickman for pointing out the improvement obtained by the new metals, sulpha and penicillin methods. One who had been working in the period before these advances especially appreciated them.

As indicated in the paper, he had had no personal experience in the use of Stader apparatus. He had not seen a case of osteomyelitis in connection with this subject. If the screws were introduced through the cortex and pierced the other cortex it facilitated fixation.

With regard to the cylindrical pins, they could be used as Mr. Knight had said, but he personally preferred the V-shaped pins. Their size had to be considered in relation to the X-ray illustrations of the marrow cavity.

All the methods had been adopted from human surgery. After using screws made of stainless steel, scarcely any had come loose.

The Chairman, in closing the proceedings, referred to the excellent demonstration they had been given on the screen. Such demonstrations were invaluable to support the observations made on a subject such as the one they had been considering. The paper and the discussion had certainly awakened interest in the newer methods of surgical treatment of fractures.

Mr. Knight had mentioned the Kirschner-Ehmer splint which in the last two years or so had come to be in common use in America and which was considered by many an improvement upon the Stader splint. He understood that there was a specimen of this splint at the Royal Veterinary College and it would be pleasing if those interested in bone surgery could have an opportunity of examining this when they went to the College the following week. The advantage it had over a plaster of paris cast was that after application it was easy to correct anatomical misalignment without removal of the splint.

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STAINLESS STEEL AS A SURGICAL DRESSING

By

E. O. LONGLEY

Eczematous caudal pruritus is a common enough condition in the dog, the patient notoriously worrying its tail to distraction. Both the application and retention of dressings in these cases can sometimes be troublesome. Lesions of the tail, traumatic, frost-bitten, and otherwise, are perhaps the commonest surgical condition encountered in the monkey, the usual sequel of which is necrosis, and the usual requirement resection. Owing to these animals' invariable and indefatigable attention to the removal of any dressing, however, the latter's retention *in situ* presents this problem at its zenith, and it is one which had in fact been accounted impossible of solution in the Zoological Gardens, London, where simple resection without any attempt at a dressing had been the practice.

Following resection without a dressing, monkeys are constitutionally unable to leave the wound alone. Healing is out of all question, the condition becomes chronic, and in due course the animals do in fact fret the tail away to a stump. Nor is this necessarily due to irritation, as might well be supposed, and as was ascertained by the writer by effecting complete durable nerve-block high in the tail with " Proctocaine " (procaine in oil). This, of course, provides a regional anaesthesia enduring for days, and although such was the established fact, it did not change in any way the animals' behaviour.

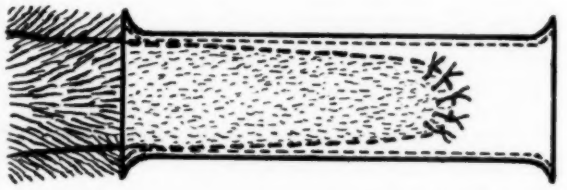
Where, however, healing by first intention can be procured, the dressing is removable within a week and the animal will be found to have lost its obsession and may be discharged completely cured. The provision of primary union is thus the crux of successful treatment, and being solely dependent on the protection of the lesion from the animal's solicitations, this defines the remedy. It is true that " Elastoplast " bandaging properly applied may serve in some cases. But it is not reliable, and has the disadvantages both that the wound is confined and that inspection requires removal of the dressing.

This note records a complete and general solution of the difficulty, which is reported not only for its canine applications but because the practising veterinary surgeon does occasionally encounter the monkey-patient with this condition.

The Stainless Steel Sleeve

A remedy will be found in all cases in the use of stainless steel cylindrical tubes, of an appropriate short length, which are fitted snugly and directly over the stump or tip of the tail and its lesion, whatever this may be. They are made as light as is consistent with strength, and very considerable strength is demanded ! Even stout duralumin similarly applied (in this case, of course, over a fabric dressing) failed signally to resist the fury of the dental attack.

The sleeves are acutely flared at one end or both, to facilitate application and prevent any possible fretting by the metallic edge (which has never occurred). Flaring at one end only has the advantage of providing a " nested set " for convenient storage. This has to be weighed against the advantages of reversibility and greater strength at the free edge that accompanies flaring at each end. They are of such length in relation to the diameter of the stump that, fitting snugly over this, they will project sufficiently beyond its end. A sample tube used on the Irish terrier mentioned later was 8 cm. long, 2 cm. in diameter, projected about 2·5 cm. beyond the tip of the tail, and weighed only 24 grammes (0·85 oz.). The sleeves are secured in position by a few turns of " Elastoplast " bandage carried forward on to the tail itself, and their application is as simple and rapid as it is entirely reliable. No additional form of protective dressing or bandaging is required.



The Steel Sleeve *in situ* over Amputation Stump, before Securing with " Elastoplast."

A set of such tubes was manufactured to specification for the writer, of " Staybrite " stainless steel. This material has the advantage not only of its very great strength, but that it is physiologically inert and hence may be applied as described directly to the skin, and even maintain contact with the lesion itself, though this is normally avoided by the design, with no ill-effects whatever (the same material is employed internally in human surgery, *e.g.*, for permanent arterial anastomoses). The sleeves are essentially durable and may be sterilised by boiling and applied sterile in the surgical case.

Not the least valuable feature of this form of dressing—which is in effect a stainless steel bandage open at one end—is that the lesion remains freely ventilated, this promoting rapid post-operative repair, and being of quite inestimable value in eczematous conditions. Furthermore, the lesion is open to inspection and, if necessary dressing, *via* the open end and without removal from the beginning.

One dog, an Irish terrier brought to the writer with intense and intractable pruritus of the tail, over which no dressing had been retained and which the animal was worrying to the point of haemorrhage, responded immediately to this treatment and dry dressing, and was cured in a matter of days. The technique is obviously equally appropriate to and convenient for protection of the surgical wound in dogs, after the flap operation.

Acknowledgment.—I am indebted to Mr. Down, of Down Bros., Mayer and Phelps, Ltd., at Tabard Street, London, S.E.1, for his interest in this problem, and the excellent and expeditious engineering service of his firm.

NATIONAL POULTRY SHOW

Following last week's announcement of a record entry for the National Poultry Show, it is now officially stated that the final number of livestock exhibits to be seen at Olympia will total nearly 4,300. In this great exhibition of Britain's finest Standard-bred poultry stocks, every breed from the blue-egg Araucuna to the more widely known breeds such as Rhode Island Red, Leghorn, Sussex, etc., will be on view. A fine display of farm poultry, consisting of over 300 turkeys, geese and ducks, is promised. The turkey exhibit is probably the largest ever to be seen under one roof. There will be 2,000 large fowl and over 1,900 miniature or bantam breeds. The whole exhibit in competition for National Championships and Awards will be judged by 22 of the country's leading poultry specialists.

THE VETERINARY RECORD

November 26, 1949

TREATMENT OF FRACTURES

THE treatment of fractures is an important part of a veterinary surgeon's work. Great advances have been made in this field during the last 30 years. Methods have been evolved to perfect reduction and alignment and to maintain the fractured bone in its normal anatomical position during the process of healing.

At first fractures were immobilised by the application of different kinds of external splints. The use of anaesthetics, by relieving pain and producing muscle relaxation, enabled reduction and alignment to be carried out with more accuracy and external splinting to be applied more satisfactorily. In addition, anaesthetics permitted open reduction and internal fixation to be practised.

The pioneers of internal fixation used a variety of metal screws and plates, made of diverse materials. Early attempts at internal fixation were often fraught with failure due to a lack of appreciation and understanding of antisepsis and asepsis. The satisfactory practice of internal fixation dates from the antiseptic era of Lister and enthusiasm for its use was stimulated in no small measure by the introduction of X-rays ; this demonstrated that a high percentage of unsatisfactory reductions were obtained by the then accepted methods of treatment.

In spite of a real appreciation of the dangers of bacterial infection, coupled with the use of antiseptics and the practice of a rigid aseptic technique, the results were too often disappointing and in consequence this method fell into disfavour and more conservative methods were employed.

During this period external immobilisation was assisted by the introduction of the modern plaster cast and more satisfactory reduction was attempted by a variety of extension splints. Direct skeletal traction by passing wires and pins through the epiphysis of fractured bones came into vogue. Except for the plaster cast these methods have little practical application in veterinary orthopaedics because it is not possible to regulate either recumbency or restraint amongst animals.

During the last ten years scientific discoveries have benefited orthopaedics greatly and the treatment of fractures by internal fixation has again become popular.

The use of sulphonamides and antibiotics, together with methods of combating shock, have permitted extensive surgical interferences to be performed without endangering the life of the animal. An understanding of the electrolytic changes which occur when metals are placed in the body has led to the use of materials which are inert in body fluids, thus making the internal fixation of fractures by plates and screws a safe practical proposition.

During this period ingenious methods of external fixation, such as the Stader and Kirschner-Ehmer splint, have been introduced and the method of treating fractures by intramedullary pinning is again being practised after a lapse of 20 years.

Whilst our aim should be to obtain quick and satisfactory healing so that the animal is without disfigurement and is highly efficient functionally, there are factors beyond our control which do not permit us to attain this ideal on all occasions. We have to consider the age and type of

(*Concluded at foot of next column*)

the animal, the purpose for which it is required, together with economic factors and the facilities available.

Open reduction and internal fixation cannot be undertaken lightly. The surgeon must have at his command a well-equipped operating theatre, X-rays and the special appliances required for orthopaedic surgery.

The majority of fractures occurring in small animals can be treated satisfactorily in the time honoured manner. A few cases require specialised methods of internal fixation.

In the case of the larger animals, fracture treatment still remains far from satisfactory. It is towards the treatment of fractures in this category that the veterinary profession should direct its attention.

CLINICAL COMMUNICATION

A CASE OF TORSION OF THE UTERUS IN A CAT

G. T. WILKINSON,

Norwich

Subject.—A six-year-old black and white short-haired queen.

History.—The animal had borne several litters of kittens in the past without any trouble. She was again pregnant and expected to commence parturition at any time although the actual date was unknown.

On Sunday, September 25th, the animal was noticed to be off its food and rather listless, but this was thought to be due to the imminence of parturition and no advice was sought. On the night of Tuesday, September 27th, the cat passed a quantity of fluid *per vaginam*, which the owner took to be due to the rupture of the " water bag." The animal showed no signs of distress or straining efforts and a further 36 hours were allowed to elapse before professional assistance was summoned.

Examination.—The animal was seen on the morning of Thursday, September 29th. She appeared to be rather apathetic to her surroundings but purred when fondled. According to the owner the animal had taken no solid or liquid food since the previous Sunday.

The rectal temperature was 103·8° F. and the pulse weak and thready with a rate of 120 per minute. The visible mucous membranes were pale and there was a slight discharge from the nostrils. The animal seemed to be disinclined to move, but adopted the natural crouched posture when left alone.

Mammary development was practically negligible, relative to what could be expected in an animal at full term. Abdominal palpation was carried out and revealed the presence of one large foetus, although no foetal movements could be appreciated. The cat showed no sign of resentment during this phase of the examination. The vulva was but slightly enlarged and the vagina would admit only the passage of the little finger with some difficulty, and with the accompaniment of pain to the animal. There was no evidence of a vaginal discharge.

A diagnosis of foetal death, with failure of the cervix and the vagina to dilate, was made and a grave prognosis given.

Treatment.—It was decided to perform complete ovarohysterectomy although the cat's condition rendered such an operation hazardous. Operation was performed on the afternoon of the same day.

The animal was anaesthetised by nembutal intraven-

ously, only one-third the computed dose being administered before deep anaesthesia was obtained. This increased the gravity of the prognosis. The operation site was prepared in the usual way and a mid-line incision made. On opening into the peritoneal cavity, a blood-stained fluid was immediately apparent and as much as possible was drained off and soaked up with sterile swabs. One greatly distended gravid cornu could be seen under the incision, over towards the animal's right side. This cornu was extremely congested and cyanotic, being a deep purple, almost black, colour. It was gently withdrawn from the abdomen, extreme care being taken to avoid rupture of the viscus, and it could then be seen that the uterus had become twisted on its longitudinal axis just anterior to the cervix. The left gravid cornu had been lying on the right side of the animal's abdomen, and the right non-gravid cornu on the left side. The latter cornu had also become twisted on its longitudinal axis and was swollen and cyanotic, the ovary being a purple sphere about the size of a barcelona nut. The cervix was small and apparently closed and the vagina was normal in appearance.

The uterus and ovaries were removed in the usual manner, division being made through the cervix, and the abdomen was swabbed out as completely as possible. 100,000 units of procaine penicillin were placed in the abdominal cavity and the abdominal wound was closed by a continuous catgut suture through the muscle layers, and a series of Halstead's sutures in nylon through the skin. 100,000 units of procaine penicillin were then injected subcutaneously.

The rectal temperature on the completion of the operation was 100·8° F. and the pulse rate 80 per minute.

The skin sutures were removed on the seventh day after operation and further recovery was uneventful.

The case is recorded because of the apparent rarity of the condition in small animals, possibly due to difficulties of diagnosis. It is suggested that torsion of the uterus must have occurred after the passage of the allantoic fluid, and was followed by re-closure of the cervix, which must have been open to allow the passage of the fluid.

It is remarkable that the animal should recover so well from such an internal catastrophe plus the effects of a major abdominal operation.

Summary

A case of uterine torsion in a cat and its surgical relief are described. The case is recorded because of the scarcity of records of such a condition in small animals.

A new breed of sheep which (says *The Meat Trades Journal*) it is confidently expected will bring about a radical improvement in South Africa's mutton scarcity, has been bred at the experimental farm of the Stellenbosch-Elsenburg College of Agriculture. Called Dormer, this newcomer to South Africa sheep farming is a cross between the German Merino and English Dorset—as is also its name. A flock of 270 has been built up after painstaking experiments over a short period. The Dormer is regarded as destined to play an important part in the Union's animal husbandry in future. Professor J. C. Swart, head of the Livestock Breeding Section at the college, and Mr. P. J. J. van Rensburg, sheep and wool officer, are both highly pleased with the sheep, the advantage of which is its large mutton yield compared with other South African breeds.

* * * * *

While we have got the National Health Service based on free prescriptions. I shudder to think of the ceaseless cascade of medicine which is pouring down Brit'sh throats at the present time. I wish I could believe that its efficacy was equal to the credulity with which it is being swallowed.—The Minister of Health.

ABSTRACTS

[The Sulkowitch Test as a Guide in the Diagnosis and Therapy of Bovine Hypocalcaemia. Detweiler, D. K., & Martin, J. E. (1949.) *Amer. J. vet. Res.* **10.** 201-207.]

The basis of this test is that there is a rough co-relation between the serum calcium and the amount of calcium being excreted in the urine.

The technique of the test depends on the precipitation of the calcium in urine by an oxalate reagent, the degree of opalescence produced being proportional to the amount of calcium in the urine. Tests carried out on the urine of cows in which the serum calcium was estimated at the time of obtaining the urine sample showed that the rough co-relation postulated as existing did apply in the cow. However, negative tests did occur when the serum calcium was in the lower part of the normal range ; for instance, the test was negative in two cases where the serum calcium levels were 8·5 and 9·2 mg. per 100 c.c. The normal range as found by Allcroft was 8·5 to 11·4 mg. per 100 c.c. Positive Sulkowitch tests occurred only where the serum calcium fell within the normal range. It follows that a positive Sulkowitch test indicates that the serum calcium is at least above the lower normal figures but a negative test does not necessarily indicate that serum calcium is below normal.

The authors claim that the test may be used as a means of determining the amount of calcium injected intravenously required to raise the serum calcium to normal. Following a negative Sulkowitch test 3 grammes of calcium gluconate are given intravenously and a second sample of urine is tested, this procedure being repeated until the Sulkowitch test is positive.

[*Abstractor's Note.*—Since a negative result does not necessarily indicate that the animal is suffering from hypocalcaemia, the test does not appear to be of much value to the clinician in differential diagnosis. Similarly the use of the test after each repeated small dose of calcium gluconate may give the clinician unreliable information.]

G. F. B.

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[Liver Damage. Its Evaluation as an Index to Prognosis. Schaffer, J. D. (1949.) *Vet. med.* **44.** 394-395.]

Schaffer describes a modified Hangar flocculation test for the diagnosis of liver dysfunction in cattle. The test is based upon the principle that an emulsion of cephalin cholesterol is flocculated by serum from an animal with liver disease.

The test is carried out as follows: To 4 ml. normal saline and 1 ml. antigen is added 0·2 ml. of the serum under test. The tube is stoppered and placed in the dark at room temperature. Readings are made at six, 12, 24 and 36 hours. In cases of severe liver damage, precipitation is complete in six to 12 hours ; moderate liver damage results in precipitation at 12 to 24 hours. Slight liver damage gives partial flocculation between 24 and 36 hours. If there is no flocculation after 48 hours *" it can safely be said no impairment of liver function is present."*

Examples of the application of the test in veterinary medicine include cases of ascites, general debility, uraemia, acetonaemia and suspected cases of hepatic cirrhosis, neoplasia and liver abscess.

A. R. J.

REVIEWS

[**Animal Breeding.** By A. L. HAGEDOORN, PH.D. Foreword by J. Hammond, M.A., D.SC., F.R.S. Third Edition (1948.) Pp. 347 + xx. Price 15s. net. Crosby Lockwood & Son, Ltd., 39, Thurloe Street, London, S.W.7.]

This excellent book is quite up to the standard one would expect from the pen of an expert geneticist who retains at the same time a practical outlook. In this third edition the author has attempted to pay further attention to present-day breeding considerations.

This is a book which must be in the possession of every veterinary surgeon, veterinary student and practical breeder.

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[**Artificial Insemination of Farm Animals in the Soviet Union.** A visual guide to the study of artificial insemination for breeders, farmers and veterinarians. Official Text-book issued by the Department of Agriculture of the U.S.S.R. Translated and compiled by J. S. Goode. Edited by H. B. Rudduck, M.B., B.S., B.V.SC., with a foreword by F. W. Bulcock. (1948.) Pp. 176. Price 42s. Angus and Robertson, Sydney: London.]

This book is liberally illustrated and is what it purports to be, "a visual guide to the study of artificial insemination for breeders, farmers, and veterinarians."

The subject is dealt with in rather too elementary a manner to warrant purchase of the book by veterinary surgeons and veterinary students. In addition, some of the techniques described, *e.g.*, the use of a speculum for insemination, would hardly be accepted now at artificial insemination centres in this country.

The book would be valuable for farmers, who, under supervision of the veterinary practitioner, are carrying out artificial insemination in their herds to control such diseases as trichomoniasis.

There are 278 illustrations.

ANIMAL HEALTH

In the course of his address to the Carmarthen Chamber of Agriculture on Saturday, November 12th, Mr. Graham Cherry, of Animal Health Trust Headquarters, asked "Is this country, acknowledged to lead the world in voluntary humane activities on behalf of animals, behind the times in its attitude to the profession especially trained and equipped to grapple with the problems of animal health and disease? I yield to none in my admiration for the work of bodies which exist to prevent cruelty or maltreatment of animals: but is not the finest form of animal welfare the giving of the blessing of full health?

"It is, at any rate, encouraging to see farmers, and others who own livestock, increasingly regarding the veterinary surgeon as a friend and adviser, to be called in not only when disease occurs but when it does *not* occur, for skilled advice in the interests of healthy stock. It is a sign that our farmers are up to date, whatever one may say of the rest of the community. But it also reminds us of the limitations upon veterinary research and education which, until the Animal Health Trust came into being, were a serious handicap to the prospects of reducing the toll of disease among our domesticated animals."

The speaker then outlined the comprehensive programme launched in 1942 by the Animal Health Trust.

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WEEKLY WISDOM

The object of learning another language is to gain access to another literature.—WINSTON CHURCHILL.

REPORT

[**Science Service, Dominion of Canada Department of Agriculture.** Report for the year ended March 31st, 1948.]

An intensive investigation of so-called rhinitis of swine was undertaken two years ago. As the results accumulated it became clear that two different conditions, simulating each other, were present, one rhinitis, an apparently communicable disease, and the other a congenital deformity, perhaps the result of breeding. The former has posed exceptional difficulties. It was discovered that the disease could be communicated from an adult-infected animal to piglets, but so far attempts to communicate it to older animals have been unsuccessful. The nature of the causative agent has not yet been determined, although a great number of experiments have been carried on.

Biological products issued during the year included: tuberculin: 1,722,606 doses; mallein: 27,796 doses; johnin: 555 doses.

The great demand on the part of livestock men for more research on insects affecting livestock resulted in the establishment of a new Livestock Insect Laboratory at Lethbridge, Alta., to serve the industry in the Prairie Provinces. This makes the second laboratory of this kind in Canada, the first having been established at Kamloops, B.C., several years ago. The investigations carried on from this laboratory will be concerned with the distribution, biology and control of warbles in cattle, bots in horses, keds on sheep, and sucking lice of livestock throughout the Prairie Provinces.

"The warble fly control campaign, initiated a few years ago at the Lethbridge laboratory, is now being sponsored by the Provincial Governments, who look to the Lethbridge laboratory for advice and guidance. There are now over 150 power sprayers in the Prairie Provinces devoted almost exclusively to warble fly control. The majority of these are owned by cattlemen who not only treat their own herds but do custom spraying as well. The results of the control campaign have been excellent and it is probable that some areas will be declared as 'warble free' in 1948.

"Experiments with the new synthetic insecticides and their value in the control of insects affecting livestock have been continued at the Livestock Insect Investigations Laboratory at Kamloops, B.C. Sprays and dips of benzene hexachloride and DDT both gave promise of not only destroying ticks already on the animals but of keeping the animals free of ticks for the active tick season. Benzene hexachloride gave the better results but only when used in a finely divided form. Both DDT and benzene hexachloride were found to be effective in controlling sheep keds and one spraying remained effective for 30 days.

"At the Kamloops laboratory, feeding animals a small dose of benzene hexachloride was most successful in studies on the control of cattle lice. The animals showed no ill effects from this treatment and within a few days no lice could be found on them. Other stock not so treated showed a marked increase in louse population during the same period. The treatment was not effective in the case of biting lice. The feeding of benzene hexachloride, however, to poultry for the control of mites, and to sheep for the control of keds, did not affect either pest."

G. P. W.

QUESTIONS IN PARLIAMENT

Bovine Tuberculosis

Mr. Hurd (November 17th) asked the Minister of Agriculture the saving in his Department's estimates to be effected by postponing the establishment of clean areas as part of a national scheme to eradicate bovine tuberculosis.

The Minister of Agriculture (Mr. Thomas Williams): The precise sum will depend upon the financial details of the scheme, which still await further consideration and consultation with the interests affected.

Mr. Hurd: Is the Minister aware that the earlier statement he made about postponing the scheme for the eradication of bovine tuberculosis caused the greatest anxiety among farmers and the veterinary profession, and will he give an undertaking that he is going to make a proper start in October?

Mr. Williams: The hon. Member is a week too late. I made an announcement in this House last week, in answer to a Parliamentary Question, that we anticipated starting the scheme on October 1st, 1950.

Mr. Hurd: I said, a proper start.

Major Sir Thomas Dugdale: It is because of the two answers that uncertainty exists; one entirely contradicts the other. Could the Minister try to clarify the position at the earliest possible opportunity so that the industry knows where it is?

Mr. Williams: The hon. and gallant Member really misunderstands the position. The original deferment was only calculated for six months. I therefore took an early opportunity of warning the agricultural community that we anticipated starting, and properly starting, on October 1st next year.

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Boars (Licensing)

Sir John Mellor (November 15th) asked the Secretary of State for Scotland what expense he incurred with regard to pigs in purported pursuance of the Improvement of Livestock (Licensing of Bulls) Act, 1931, before October 24th, 1949, the date appointed by S.I., 1949, No. 1911, s. 131, for the application of the said Act to pigs as to cattle; by what authority he incurred this expense; and what was the date upon which such authority commenced.

Mr. Woodburn: The net expenditure incurred before October 24th, 1949, in administering the Improvement of Livestock (Licensing of Boars) (Scotland) Regulations, 1946, was approximately £1,000. This expenditure was incurred under Section 12 of the Improvement of Livestock (Licensing of Bulls) Act, 1931. Section 6 of the Agriculture (Miscellaneous Provisions) Act, 1944, and the regulations made under these Acts. The date upon which such authority commenced was May 1st, 1946.

Sir J. Mellor: Is it not a fact that the right hon. Gentleman forgot to appoint a date until he appointed October 24th last for this legislation to become applicable to pigs? In those circumstances how could he have any authority to incur expense before that date?

Mr. Woodburn: The hon. Member is thinking of two different orders. The second order dealt with that matter in one way and the first order dealt with it in another way.

Sir J. Mellor: Does the right hon. Gentleman suggest that the regulations of 1946 carried with them any authority to incur expense?

Mr. Woodburn: So far as I know the regulations made under that Order were in order.

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Fowl Pest (Affected Areas)

Sir Basil Neven-Spence (November 17th) asked the Minister of Agriculture on how many and on which of the areas affected by fowl pest a ban has been imposed on the movement of live and dead poultry.

Mr. T. Williams: The movement of live poultry into any other part of Great Britain is prohibited from (i) an area comprising England and Wales except the counties of Cumberland, Durham, Northumberland and Westmorland, the Furness Division of Lancashire and the Isles of Scilly, and (ii) the Orkney Islands. The ban on the movement of uneviscerated poultry carcases from the Orkney Islands has been removed from to-day.

ANIMAL DISEASES RESEARCH ASSOCIATION

Legacy for "J. P. Walker Memorial Fund"

A bequest of £1,000 to the Animal Diseases Research Association, Moredun Institute, Gilmerton, Edinburgh, has been made by the late Mrs. M. M. Walker, widow of J. P. Walker, M.R.C.V.S., Haddington, for the formation of a permanent fund to be known as the "J. P. Walker Memorial Fund," the interest of which is to be used for some specific purpose, at the discretion of the Directors of the Association.

NOTES AND NEWS

Diary of Events

Dec. 1st.—Meeting of the Central Veterinary Society at the Royal Veterinary College, Camden Town, 6 p.m.

Dec. 2nd.—Meeting of the South Wales Division, N.V.M.A., at Neath (Castle Hotel), 2.15 p.m.

Dec. 7th.—Meeting of the South-Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Dec. 14th.—Meetings of the Executive (2 p.m.) and Editorial (3 p.m.) Committees, N.V.M.A.

Dec. 30th.—Annual Dance, Dumfries and Galloway Branch V.V.B.F. Ladies' Guild, at Dumfries (Cairndale Hotel).

Jan. 15th, 1950.—R.V.C. Students' Society Annual Ball, Grosvenor House, Park Lane, W.1.

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Collection of Accurate Data on the Incidence of Disease

Some time ago particulars were published in this journal of a scheme for collecting accurate data on the incidence of disease. Members will have noticed that four forms are to be used in this scheme and the Association called for volunteers from among practising and other veterinary surgeons to co-operate in collecting this information. (See *The Veterinary Record* of October 1st, No. 40, Vol. **61**, page 614.)

A number of veterinary surgeons have offered their help, but insufficient numbers have as yet volunteered. It should perhaps be made clear that offers of help would be welcomed from veterinary surgeons even if there is only one herd-owner who can be persuaded to co-operate. In the earlier notice each veterinary surgeon was asked to bring in ten herd-owners, and this may have been a deterrent in many cases.

This is a further appeal to any members interested, therefore, to send in their names to the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1.

The forms will be available within the next 14 days for distribution. A full explanation of the scheme and its requirements will be forwarded to all who offer their co-operation in this important field scheme of collection of accurate data of disease incidence.

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Supplementary Veterinary Register

The Royal College of Veterinary Surgeons has announced that, in accordance with the provisions of section 6(4) of the Veterinary Surgeons Act, 1948, 403 persons made application in the prescribed form before the due date, namely, midnight July 29th to 30th, 1949.

Under the Act no application can be made after this date except by leave of the Council of the Royal College.

The applications which were received for registration in due time are now receiving the careful consideration of the Council and in certain cases the applicants are being interviewed. This process is inevitably a slow one, and it will be recollected that in the registration of unqualified dentists under the Dental Act of 1921 several years were occupied. It is anticipated that the Supplementary Veterinary Register will be completed by the early part of next year.

Meanwhile all persons who have made application for registration by the due date are protected and are permitted to carry on practice until a decision has been made in their individual case.

University of Glasgow Veterinary School

It is understood that the University of Glasgow has applied to the Privy Council for a direction under section 3 of the Veterinary Surgeons Act, 1948, and that the Privy Council, after consultation with the Council of the Royal College of Veterinary Surgeons, has made such a direction.

Section 3 provides that a university in the United Kingdom which does not present students for a registrable veterinary degree may apply to the Privy Council for a direction that the Royal College of Veterinary Surgeons shall examine its veterinary students for the diploma of M.R.C.V.S. In such a case the Privy Council has to consult with the Council of the Royal College.

The application by the University was necessary because Glasgow Veterinary College was recently incorporated in the University and ceased to exist as a legal entity. The Royal College of Veterinary Surgeons was bound to examine the students presented by Glasgow Veterinary College because the College was affiliated under Royal Sign Manual to the Royal College of Veterinary Surgeons under the Royal Charter of 1844.

When Glasgow Veterinary College ceased to exist the effect of the Royal Sign Manual also ceased to exist, and in order that the students of the Glasgow Veterinary College who had been taken over by the university should continue their studies for the diploma of M.R.C.V.S. it was necessary to ask for the direction.

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Honorary Associateship of the Royal College of Veterinary Surgeons

On Wednesday, November 16th, the President of the Royal College of Veterinary Surgeons, Professor T. Dalling, received Dr. Raymond Alexander Kelser at the Royal College of Veterinary Surgeons, and in a private and informal ceremony conferred upon him the honour of Honorary Associate of the Royal College of Veterinary Surgeons.

Dr. Kelser was awarded this honour earlier in the year, but as he was unable to attend the 14th International Veterinary Congress his formal induction was postponed until he came to London for the lectures which he has been giving at the Royal Veterinary College and Hospital of London under the auspices of the University of London.

Dr. Kelser has had a very distinguished career, and he is Dean of the Faculty, and Professor of Bacteriology in the School of Veterinary Medicine, in the University of Pennsylvania at Philadelphia. Dr. Kelser is Brigadier-General (retired) of the United States Army Veterinary Corps.

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PERSONAL

Births.—Garner.—On November 10th, 1949, at the Plateau Hospital, Jos, N. Nigeria, to Daphne (*née* Gascoyne), wife of R. J. Garner, Colonial Veterinary Service, a son.

Millar.—On November 12th, 1949, at the Shiel Nursing Home, Weybridge, to Diana (*née* Fox), wife of P. G. Millar, M.R.C.V.S., a daughter—Jennifer Diana.

Tayler.—On November 14th, 1949, to Margaret (*née* Currie), wife of Reginald C. Tayler, M.R.C.V.S., a brother for the twins—David Reginald.

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Colonial Veterinary Service Promotions and First Appointments.—The following promotions are announced: Mr. G. M. Gates, Veterinary Officer, Nigeria, to be Assistant Director of Veterinary Services, Nigeria; Mr. H. M. Stuchbery, Senior Veterinary Officer, Tanganyika, to be Deputy Director of Veterinary Services, Nyasaland, and Mr. C. R. Turbet, Senior Veterinary Officer, Fiji, as Senior Animal Husbandry Officer, Nyasaland.

Announcement is also made of the following first appointments: Mr. A. H. J. Colley, Veterinary Officer, Northern Rhodesia; Mr. E. P. Lindley, Veterinary Research Officer, Nigeria; Mr. R. L. McKenzie, Veterinary Officer, Uganda; Mr. W. P. McMillan, Veterinary Officer, Uganda; Mr. W. Plowright, Veterinary Officer (Pathologist), Kenya; Mr. P. W. Swire, Veterinary Officer, Nigeria, and Mr. G. H. Yeoman, Veterinary Officer, Tanganyika.

Forthcoming Marriage.—Darbyshire—Small.—The engagement is announced between James H. Darbyshire, B.Sc. (Lond.), M.R.C.V.S., Government Veterinary Officer, Salisbury, Southern Rhodesia, and Miss Molly Spencer Small, younger daughter of Mr. and Mrs. A. Small, of Bishopsworth, Bristol, England.

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Death.—Barr.—On November 16th, 1949, at the Cumberland Infirmary, Carlisle, James Armstrong, dearly beloved infant son of Janet and John Barr, Penrith.

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Will.—Mr. Harold Duncan Jones, M.R.C.V.S., of 6, Lyndhurst Square, Peckham, formerly of 138, Crofton Road, Camberwell, left £18,074.

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R.C.V.S. OBITUARY

Allan, William, 9, Broad Street, Wokingham, Berks. Graduated N. Edinburgh, July 23rd, 1885. Died at Cromar House, Wokingham, November 17th, 1949; aged 90 years.

Johnston, John, 3, George Street, Driffield, E. Yorks. Graduated Edinburgh, July 18th, 1931. Died November 21st, 1949, as the result of an accident in the hunting field.

Seldon, Edward Ernest, Brevet-Major, R.A.V.C. (T.F.) (retd.), of Elim, Tetbury, Glos. Graduated London, December 15th, 1893. Died November 16th, 1949; aged 78 years.

Mr. Jack Johnston Killed While Hunting

We record with much regret that Mr. Johnston was fatally injured on Monday last while out with the Middleton East Hunt. When jumping a hedge his horse struck a concealed strand of barbed wire and fell on him. His colleagues and clientele will mourn the death of an able and much-respected practitioner and will sympathise deeply with the widow and three children in their tragic loss.

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SWINE ERYSIPELAS VACCINE

The Veterinary Laboratory, Ministry of Agriculture, Weybridge, has restarted the issue of Swine Erysipelas Vaccine. The vaccine, which consists of a living, avirulent strain of the causal organism, is still in the experimental stage as its immunogenic value against the disease under field conditions has not yet been determined. The keeping properties of the vaccine are poor, so it should be ordered weekly in amounts sufficient for immediate use.

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FOWL PEST IN NORTHERN IRELAND

An outbreak of fowl pest—the first which has occurred in Ireland—was confirmed on a farm near Ballycastle, County Antrim, on November 11th. Out of a flock of 200 birds 70 died of the disease; the remaining 130 were destroyed.

In view of the highly infectious nature of fowl pest the Ministry of Agriculture has issued a warning to poultry keepers to be especially watchful for any sign of the disease.

Mr. H. L. M'Connell, Deputy Chief Veterinary Officer of the Ministry, who is at the head of a squad of Ministry Officers who are at Ballycastle to combat the disease, has said that he is very hopeful of stamping it out, adding that poultry keepers in the district—one of the biggest egg-producing areas in the province—are working closely with Ministry officials to stamp out the outbreak.

The disease has been prevalent in England since it arrived from the Continent early in 1947. It caused serious losses, especially in Lancashire, and spread to Scotland. The Ulster Ministry of Agriculture recognised the danger and immediately banned the import into Northern Ireland of fowls, game, and eggs from England and Scotland.

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IMPERIAL COLLEGE OF TROPICAL AGRICULTURE

Sir Raymond Priestley has been appointed Chairman of the Governing Body of the Imperial College of Tropical Agriculture, Trinidad, B.W.I., in succession to the late Sir Frank Stockdale.

Sir Raymond Priestley, who has been Principal and Vice-Chancellor of the University of Birmingham since 1938, was Vice-Chancellor of Melbourne University from 1935 to 1938. Since 1946 he has been Chairman of the Universities Advisory Committee of the British Council and is Chairman of the recently established naval education Advisory Committee.

DETERIORATION IN SLAUGHTERING TECHNIQUE

At a recent meeting of the Consultative Committee for the Retail Meat Trade (reports the *Meat Trades Journal*) a National Federation spokesman frankly told the Ministry that meat was being treated as a by-product of the hide and although it had never been denied that the standard of flaying was high, the standard of slaughtering, dressing and the handling of the meat, in many cases, had deteriorated to a deplorable extent during the past nine years. One speaker instanced a case where he had been present in a slaughterhouse and had seen men undertaking their killing duties stripped to the waist, which was most unhygienic. The Ministry's attention was drawn to the fact that greater use was being made of the saw in pre-control days when the butcher was able to handle a well-finished article. Now in a great many cases the animal was being split from top to bottom by means of the chopper, which practice often resulted in the mutilation of the carcase. Federation speakers pointed out that it was the duty of the Ministry to emulate the example set in pre-war days, because retailers would not be prepared to endure the present deplorable system much longer. The Ministry were asked why it was in some cases that as much as 40 per cent. of the permit was being received in the shops as late as Friday afternoon; why calves were being delivered on Saturday; why the grading at the abattoirs in certain areas was done so imperfectly; and why calves and lambs often reached the shops in a warm condition. In the view of the National Federation all these shortcomings pointed to the mismanagement in Ministry circles and the time had arrived when active steps should be taken to rectify matters. The trade representatives also expressed serious concern over the unhygienic way in which much of the meat and offals were being transported to the shops, and they urged the Ministry to effect improvements.

Sir Henry Turner (Director of Meat Supplies), who occupied the chair, frankly admitted that he was as dissastisfied with the present phase as was the trade, but they would have to recognise that under existing circumstances it was impossible to make as quickly as anyone would like the improvements which, he agreed with them, should be made. They could be sure, however, that the Ministry were making every effort to improve methods. Preparations were in hand for improvements at a number of slaughterhouses, but there were a number of limiting factors which delayed the carrying out of the plans quickly to the point of completion. There was, for instance, a noticeable shortage of labour and materials for the building industry, while at the same time the Ministry of Works were naturally concerned to give building priorities for other, and, in many cases, even more urgent work, such as the building of hospitals, etc.

So far as the technique of slaughtering was concerned, the Chairman pointed out that about half the contracts were held by the retail trade, and he felt that he could therefore look to the retailers themselves to achieve and maintain a high standard of workmanship which would be an example to other contractors.

It was pointed out to the Ministry that it was not easy to trace the party who was blameworthy when a complaint was being investigated, and often when a complaint was registered with a contractor he placed the blame on an employee, or vice versa. It was the Federation's view that the Ministry should decide who should accept the responsibility from the beginning of the slaughtering process to the end.

Mr. A. W. Anderson (Slaughtering Supervisor to the Ministry) pointed out that there were many angles to the slaughtering problem, but he thought it was a fair opinion to give that the workmanship generally had deteriorated. This was probably due to two causes; first, the cattle did not now belong to the individual, and secondly, the "peak" kill was concentrated into a period of about two months. He explained that the Ministry were endeavouring to improve upon the lot of the slaughterman, and it was a known fact that he would do a better job in a modernised slaughterhouse than he would do if the working conditions were not so satisfactory.

Sir Henry Turner explained that, so far as transport was concerned, steady progress had been made during the past two years in the supply of new vehicles with hanging gear, and to extend the supply of offal containers, but even here, owing to a number of general factors which they would recognise, progress was not so fast as they all would like.

Sir Henry Turner then invited the trade organisations to submit any practical suggestions which would be designed to improve upon the present position, and he promised that the Ministry would give careful consideration to any such submissions.

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KERRY SLAUGHTERHOUSE CONDITIONS CRITICISED

Animals are slaughtered and meat handled in the eleven slaughterhouses in the Tralee urban area which are "to say the least of it, appalling," according to Mr. T. F. O'Hara, M.R.C.V.S., whose comment is contained in the annual report of the Kerry County M.O. for 1948, which has just been published. "In the vast majority of cases," he states, "the roofs, walls and floors are in an extremely bad condition. There is no provision for hot water, and on the whole the premises used are derelict and rat infested. It is not possible to produce food hygienically under such conditions."

Commenting on conditions in Killarney rural area, Mr. O. Gleeson, M.R.C.V.S., states that improvements in all slaughterhouses had brought them near to standard, but that the position in Killorglin made a public abattoir the only solution.—*Irish Press.*

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LEGAL NOTES

Fowl Pest Order Offences.—At Andover, Hants, recently, Mr. T. S. S. Goode, a farmer, was fined £10 for not reporting fowl pest in his birds at the farm between May 1st and June 17th, £1 for not reporting the disease in some more of his birds in store at Andover Co-operative Society, £1 for allowing healthy poultry access to those affected by the disease, £1 for allowing poultry with fowl pest outside his farm, and £5 for using a lorry from the affected farm without licence from an authorised person. He also had to pay £4 5s. 3d. costs.

Mr. F. H. Isherwood, prosecuting, said under the regulations—which were designed to prevent fowl pest from spreading—poultry keepers were compelled to report any outbreaks of the disease to the police immediately, and to detain all the birds or their carcases on their farms. "This disease is a very serious matter. It is like a scourge, and once it gets in a flock it goes through them like wild-fire. It is most essential that every possible step should be taken to stop it spreading. In this case the prosecution say that no steps were taken to prevent it spreading, and, as a result, the risk of it spreading outside Walworth Farm was very great indeed."

Mr. J. R. Anderson, Ministry of Agriculture Veterinary Inspector, of Winchester, said he found 22 ailing birds at Walworth Farm, all showing symptoms of fowl pest. An examination of four out of 42 dead birds confirmed that they had died from this disease. There were about 60 other dead birds on the farm, some in a shed and others in a van. He had all the birds on the farm destroyed—158 fowls, 71 ducks and 32 geese.

Mr. E. G. Morris, Divisional Veterinary Inspector, said that of the 183 carcases that had been taken to Andover Co-operative Society store, fowl pest was found in 119 of them. The remainder were left in the refrigerator and allowed to be sold.

Defendant said in evidence that he first noticed trouble in his flock of 600 to 700 poultry soon after he had bought some birds at Salisbury market about three weeks before the outbreak was confirmed. He noted symptoms and consulted a reference book which he used frequently. As far as he could see they showed signs of having roup, and this was confirmed by what he read in the book. There was no reference in the book to fowl pest and he had no idea, at first, that the birds had got it. The first suspicion he had was on the same morning that a Police Inspector came. About 30 fowls had died during the previous night. He added that he had always placed his birds in cold storage at the Co-operative Society, before sending them on to the hotel in Bournemouth where he sent about 100 birds every week.

Through the fowl pest he had lost 250 birds, for which he could not claim compensation. Had he suspected this disease earlier he would have reported it and saved himself that loss.

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RECORD BUTTER-FAT YIELD

Mr. Jones, of Bangor, has reported that his cow, Aymonds Pansy II, has produced 16,648 lb. of milk, yielding 1,133·75 lb. of butter-fat in a single lactation of 359 days, which is a record for butter-fat for a Guernsey cow calving at normal intervals. This cow has been a consistently high producer throughout her life. Mr. Jones's farm is only a small-holding in an exposed position in North Wales.

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RAILWAY TRANSPORT OF LIVESTOCK

At a recent meeting of the Council of the British Horse Association, Mr. J. O'Connell (representing British Railways) intimated that a Committee had been formed by the Railways to "investigate the transport of all livestock by railways." They were not concerned with rates, but simply with the methods of transport by railways, in vans or horse boxes. He asked for the co-operation of the British Horse Society, and Col. G. de Chair was appointed as the Society's representative to submit ideas, criticisms and suggestions whereby horses and ponies could be carried quicker and under better conditions. It was resolved to inform the Breed Societies so that they might also submit ideas and suggestions.

Protection from Tuberculous Infection

At the second Commonwealth and Empire Health and Tuberculosis Conference, which was held at the Central Hall, Westminster, from July 5th to 8th, 1949, Dr. Edith Summerskill, Parliamentary Secretary to the Minister of Food, in opening the session, stressed the dangers from tuberculous milk and the opposition that there had been to the first Bill to enforce pasteurisation. This was in 1938, when she first entered the House as a backbencher. It had given her great satisfaction to pilot the present Bill through the House. She was sorry that compulsory pasteurisation could not yet be applied throughout the country, but the first area would soon be scheduled. She also gave full weight to the work that had been done by the Animal Health Division in eradicating tuberculosis, although she looked upon this as a long-term project.

Mr. Joan Francis, B.Sc., M.R.C.V.S., said that Dr. Summerskill had made a very fair statement about the measures being taken to protect man from bovine-type infection. Sir Wilson Jameson had spoken upon the subject earlier in the conference and had mentioned particularly pasteurisation, but had completely failed to say anything about what had been done to control tuberculosis in cattle.

Mr. Francis felt it was now necessary to examine afresh the real importance of bovine type infection in man, which had been a subject of much emotional controversy for the past 50 years. There was no direct relationship between the incidence of tuberculosis in cattle and the total mortality from human tuberculosis in country districts. There was, from the evidence displayed, a remarkable inverse relationship. On the whole, therefore, it seemed that infection acquired from drinking tuberculous milk was relatively mild and did to some extent immunise against the more serious respiratory infection. He realised he was treading on very dangerous ground. He was *not*, of course, opposed to pasteurisation. But it must be realised that unless much more was done than at present to control human tuberculosis, pasteurisation of milk in itself would have only a minimal effect in reducing the total mortality and morbidity of human tuberculosis.

As considerable success had been achieved in eradicating tuberculosis from cattle it was pertinent to enquire whether the lessons learnt in this field could be applied in any way to the control of human tuberculosis. So far as the human disease in this country was concerned, the answer was simple. We had not really tried any of the measures likely to lead to its control. Research workers had not even studied the subject on which proper methods could be based. Since the last report of the Royal Commission was published in 1915 the scientific study of tuberculosis had attracted little attention. During the war intensive efforts had been devoted to the study of droplet infection, cross-infection, and infection of burns, but little attention had been given to the process of infection in tuberculosis, or even the much simpler subject of killing the tubercle bacillus outside the body. Even the best therapeutic or surgical treatment was merely a rearguard action and every person who entered a sanatorium represented a failure of the tuberculosis service.

Great interest was aroused in any new surgical treatment; and when streptomycin became available there were special appeals for the treatment of tuberculous meningitis. But what was the attitude towards a possible mode of prevention? Professor A. Walgren, on the previous day, had stated that he had not seen a single case of meningitis or miliary tuberculosis in a person vaccinated with BCG. This vaccine had been available for nearly 30 years, but, as Professor W. H. Tytler had said, *Great Britain was the only country of any importance that had failed to contribute in any way to our knowledge upon the use of BCG for the immunisation of man.* It was still stated that we did not know whether or not BCG was of any value, but if one collected the statistical evidence on controlled trials and then looked, for example, through Topley and Wilson's "Textbook of Bacteriology," one would find that there was better statistical evidence on the value of BCG in man than on any other single immunological procedure used in man.

He believed that ultimately, in man as in cattle, success in controlling the disease would be found to depend on making every effort to prevent the spread of infection. When this had been done and we had removed the tubercle bacillus from the environment of man as well as of cattle, the last of the great infectious diseases in Britain would have been brought under control.

Despite the progress in the control of bovine tuberculosis, Dr. J. L. Horne rightly emphasised the importance of taking all possible measures, including pasteurisation, to prevent infection of man at the present time.

Mr. J. N. Ritchie, deputy chief veterinary officer, Ministry of Agriculture, described the progress of the attested herd scheme and how this progress was being achieved. In June there were 1,603,600 cattle in attested herds and 250,000 in tuberculin tested herds; this out of a total cattle population of about nine million.

Mr. J. Hunter-Smith and Mr. David Gemmill presented the farmer's view. Although there were certain difficulties, especially for small farmers, the scheme to control tuberculosis in cattle had the whole-hearted support of all farmers' organisations. Quite apart from the public health aspect, they emphasised the important economic effects of eradicating tuberculosis. There was no comparison between the health of a tuberculous and non-tuberculous herd. In the former the milking life of a cow might be about three years, and in the latter five years or longer. This was of great importance because it meant that far more heifers were available for replacement, which either rendered it possible to produce more beef, increase the size of the herd or, by selective breeding, to develop a herd with a larger milk production. All these objectives were obviously of great importance at the present time.

In summing up, Professor W. H. Tytler emphasised that, although bovine type infection might provide protection against subsequent pulmonary infection, it was a very dangerous method of immunisation and should be replaced with BCG. He was pleasantly surprised by the rate of progress in controlling tuberculosis in cattle and it appeared that it was being done more economically than in the United States. He felt, however, that in the meantime all milk should be pasteurised.

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NEWCASTLE VIRUS DISEASE IN MAN

"The virus of a common disease of domestic fowls, first isolated in 1927 by Doyle in Newcastle and hence known as Newcastle disease, has until lately been regarded as an uncommon human pathogen," states *The Lancet* in an annotation in its issue of November 12th, and continues: "Indeed, before 1948 the only known examples of human infection were sporadic cases of conjunctivitis either in laboratory workers or in people handling poultry; in further cases of this kind reported in the U.S.A. this year,[1, 2] the virus has been recovered from washings or swabs from the conjunctiva. But in 1948 Howitt and others,[3] investigating a febrile disorder accompanied by meningoencephalitis, occurring in epidemic fashion in Tennessee and Alabama, found that the convalescent sera from these patients neutralised Newcastle disease virus (N.D.V.) to a high titre when mixtures of virus and serum were inoculated into fertile hens' eggs. They concluded that widespread infection by the fowl virus did occur at times in man, though they did not prove their point by recovering virus from human specimens, nor did the clinical picture of their cases resemble that previously recorded in laboratory infections of the eye by the virus. Intrigued by this report, Jungherr and others[4] have investigated similar cases of a mild meningoencephalitis, and they have also studied serum samples from mumps patients. Unexpectedly, the convalescent mumps sera were the ones which neutralised N.D.V. strongly, whereas the sera from the meningoencephalitis cases had either a slight or no neutralising capacity for this virus. In a further report[5] these workers give more detail of this investigation. Sera from 22 cases of clinically typical mumps, yielding mumps virus in eleven instances by direct test, were examined with both mumps and N.D.V. antigens. Complement-fixation and agglutination-inhibition tests showed the expected rises in antibody to mumps virus during convalescence. Sera from 14 control cases of meningoencephalitis and from seven cases of non-paralytic poliomyelitis did not show evidence of mumps infection by the agglutination-inhibition or complement-fixation tests. When examined against N.D.V., 13 of the 22 mumps cases gave high titres of serum-neutralisation in eggs, and seven of 20 pairs of sera showed a fourfold or greater rise in antihaemagglutination properties to N.D.V. during the course of convalescence. In contrast, only three of the control sera gave high titres of neutralisation to N.D.V. and none showed a rise in antihaemagglutinating factors against this virus. In the five cases of meningoencephalitis where the spinal fluid was examined for N.D.V. the virus could not be isolated.

"These results are against the view that Newcastle disease virus is widely concerned in human disease. Serological results with this virus obviously require cautious interpretation, and apparent neutralisation of the virus *in vitro* may be due to some property of the serum other than specific antiviral antibody. Another possibility is that mumps and N.D.V. share some common antigen, and several years ago Burnet and his associates[6] emphasised the biological closeness of N.D.V. to mumps and the influenza viruses in virtue of the effects of their several agglutinins on human red cells. It is clear that virus infections will often be very difficult to differentiate unless the actual viruses can be isolated."

References

1 Freymann, M. W., & Bang, F. B. (1949.) *Bull. Johns Hopk. Hosp.* **84.** 409.

2 Ingalls, W. L., & Mahoney, A. (1949.) *Amer. J. publ. Hlth.* **39.** 737.

[3] Howitt, B. F., Bishop, L. K., & Kissling, R. E. (1948.) *Ibid.* **38.** 1263.
[4] Jungherr, E., Luginbuhl, R. E., & Kilham, L. (1949.) *Science.* **110.** 333.
[5] Kilham, L., Jungherr, E., & Luginbuhl, R. E. (1949.) *J. Immunol.* **63.** 37.
[6] Burnet, F. M., McCrea, J. F., & Stone, J. D. (1946.) *Brit. J. Exp. Path.* **27.** 228.

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Movement of Stock Cockerels.—Representations have been made to the Ministry of Agriculture regarding difficulties experienced by poultry keepers in connection with the movement of stock cockerels to their premises owing to the requirement of the Live Poultry (Regulation of Sales, Exhibitions and Movements) Order, 1949. The Ministry has decided to allow an exception in respect of the movement of birds to premises to which stock cockerels from approved breeders' premises have been taken or sent. Licences will be issued to approved vendors of stock cockerels in cases where the Ministry is satisfied that the vendor's stock is healthy.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Foot-and-mouth Disease:

East Sussex.—Millfields Farm, Bolney, Sussex (November 19th).

* * * * *

Americans are being warned by their Department of Agriculture that mutton will become as rare as buffalo meat unless some way is found to recruit shepherds. There are only 32,000,000 sheep in the U.S., compared with 46,000,000 80 years ago, when the population was a quarter its present size. In the hoped-for revival of the sheep-breeding industry in this country, sight must not be lost of the same limiting factor.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

MONILIASIS IN GREAT BRITAIN

Sir,—It is stated in the account of the research work at present being carried out by the Animal Health Trust's Poultry Research Station (*Vet. Rec.*, **61.** 767) that a disease of turkeys caused by *Monilia* was first recognised in the United Kingdom this year. This is not so; it was recognised many years ago. It is more than 15 years since Moniliasis was diagnosed in turkeys from a farm near Edinburgh. This was after the publication of the paper, "Moniliasis in Turkeys and Chickens," by Hinshaw, in 1933 (Hinshaw, W. R. (1934.) Proc. World P. Congress, Vol. III, 190), prior to which the disease may have been present but not recognised.

Odd cases have since come to our notice from time to time in chicks and turkeys from Scotland and from the North of England, but the serious outbreaks which occurred in England during the past summer have never been experienced.

All our cases have been associated with *Candida albicans*, except one which was due to *Oidium* species.

In view of the accounts of the disease already available in the literature, to which we had nothing to add, and to its appearing to be of relatively little importance in this country, as only sporadic outbreaks were seen and these appeared to be prevented by closer attention to sanitary measures, no publication was made.

Yours faithfully,

J. E. Wilson.

Ministry of Agriculture and Fisheries,
Poultry Laboratory,
Eskgrove,
Lasswade,
Midlothian.
November 14th, 1949.

OEDEMA DISEASE OF SWINE

Sir,—I have read with interest Dr. Barron's letter *re* oedema in pigs, but my experience of the disease in my practice, extending over several years, does not coincide with his. By far the greatest number of my outbreaks has occurred in pigs which have not been moved, a small number has occurred in pigs recently purchased in markets, etc., and a few have occurred in pigs moved, after weaning, from the breeding farm to other farms under the same ownership.

I have never had as many as 50 per cent. of the batch affected simultaneously—usually only about 5 per cent., followed by others at intervals of 24 hours. I had an outbreak in 1944 in which the mortality in the herd, a self-contained one, reached alarming proportions and extended over a period of several weeks. The mortality in most of my outbreaks has been under 20 per cent. of the herd, and cases of spontaneous recovery do occur, but unfortunately not very often.

I have not met the condition in pigs which have been running out to grass, and for some years, for want of a better name, have referred to the condition as "crew-yard disease." I have, however, like Dr. Barron, met the disease under all sorts of conditions of pig husbandry and feeding, and have changed my view that it is solely dietetic in origin; while agreeing that it is an infectious disease, I do not think it is a contagious one.

Yours faithfully,

R. D. Callaghan.

6, Pen Street,
Boston, Lincs.
November 18th, 1949.

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BEHAVIOUR IN ANIMALS

Sir,—The correspondence on this subject initiated by Mr. Bridgeman and ably carried on by Miss Joshua, Mr. Longley and others, prompts me to record two cases of curious behaviour in animals.

1. The first was a Malayan bear in a bear pit at a certain zoological garden. The animal had been lame for some months, and in consequence was receiving special attention from the bun-giving public. When months had elapsed with no signs of improvement, the animal was trapped, placed in isolation from all the other bears, given a general anaesthetic, and the lame leg thoroughly examined by a veterinary surgeon. Nothing could be found to account for the lameness. All limbs were then examined, and again the bear showed no lesions whatsoever to explain the lameness. On recovering from the effects of the anaesthetic the bear walked sound, was returned to the pit with its fellows, and has walked "sound" ever since.

It is possible that the general anaesthetic caused the animal to "forget" its association of lameness with extra tit-bits. It may at one time have been genuinely lame; this would excite sympathy from the visiting public.

2. This was a case of plain murder and occurred in a large open-air Rhesus monkey enclosure in the same zoo. In this enclosure was a shallow concrete "pond" a few yards long, with two or three inches depth of water in it. On two different occasions a young monkey was found dead in the enclosure. In both cases death was apparently from drowning. A watch was set on the enclosure and when a young monkey came to the little pond and bent down to the water, an older monkey was seen to pounce on the youngster from behind, and hold the baby monkey's head under the water. The culprit was caught and summarily executed.

Yours faithfully,

Brierley Hill, Staffs. D. J. Anthony.

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VICTORIA VETERINARY BENEVOLENT FUND

Christmas Appeal

Sir,—May we once again crave space for the usual appeal that this Fund makes for help to provide those little extra comforts that mean so much to our recipients at Christmas.

The Fund has in the past been able to give such gifts to all our recipients and it is the earnest desire of the Fund that with donations, in money or in kind, it will be able to do the same this year. Donations should be sent addressed to the Secretary, Victoria Veterinary Benevolent Fund, 10, Red Lion Square, London, W.C.1, by whom all donations will be gratefully acknowledged.

Yours faithfully,

Arnold Spicer, *President.*
P. J. Simpson, *Hon. Secretary.*
Victoria Veterinary Benevolent Fund.

10, Red Lion Square,
London, W.C.1.
November 18th, 1949.